Amendments to the Specification:

Please replace paragraph [0005] with the following rewritten paragraph:

[0005]   In the above-described prior art, the time when the electronic components will run short in the electronic-component mounting machine is predicted, and the workers are informed of the predicted time. However, though the workers are plural, who of the workers should carry out which of the assisting works is not determined, and the workers are ~~formed~~ informed of just the predicted time. Therefore, the assisting works cannot be carried out at a sufficiently high efficiency.

Please replace paragraph [0010] with the following rewritten paragraph:

[0010]   In the case where there are a plurality of workers who carry out assisting works, it is required that the assisting works be appropriately assigned to the workers. For example, if one assisting work is carried out by more than necessary workers, then respective operation efficiencies of the workers may be lowered. In addition, if a certain assisting work is not ~~carry out~~carried out by any workers because all workers misunderstand that the assisting work has already been carried out by someone else, then an operation time of a substrate-related-operation performing machine may be decreased. The present assisting-work managing apparatus determines a worker who is to carry out an assisting work. Therefore, each worker can clearly recognize an assisting work to be carried out by himself or herself. Thus, the operation efficiency of each worker and the operation time of each substrate-related- operation performing machine can be improved.

Please replace paragraph [0025] with the following rewritten paragraph:

[0025]   For example, when an operation of a substrate-related- operation performing machine is stopped for a worker to carry out an assisting work thereon, there may be another assisting work that needs to stop the operation of the machine. In this case, if the latter assisting work is simultaneously carried out by another worker, a time duration in which the

operation of the machine is stopped can be reduced as compared with the case where the two

assisting works are carried out at different times.

Please replace paragraph [0031] with the following rewritten paragraph:

[0031]   Fig. 1 is an illustrative view of a general construction of a substrate-related-

operation performing system to which the present invention is applied.

Fig. 2 is a view showing an assisting-work master file.

Fig. 3 is a view showing a portion of a worker master file.

Fig. 4 is a view showing a portion of a current worker information.

Fig. 5 is a view showing a portion of a supplying work list.

Fig. 6 is a view showing a portion of a recovering work list.

Fig. 7 is a flow chart representing an assisting-work management program as

an embodiment of the present invention.

Fig. 8 a graph representing a portion of the supplying work list.

Fig. 9 is a flow chart representing a temporary supplying-work assignment

routine as a portion of the assisting-work management program.

Fig. 10 is a view showing a display screen of a portable terminal device.

Fig. 11 is a flow chart representing a supplying-work assignment confirmation

routine as another portion of the assisting-work management program.

Fig. 12 is a view shoring showing a portion of the current worker information

at a time different from the time corresponding to the current worker information shown in

Fig. 4.

Fig. 13 is a flow chart representing a recovering-work assignment routine as

another portion of the assisting-work management program.

Fig. 14 is a view showing the recovering work list at a time different from a

time corresponding to the recovering work list shown in Fig. 6.

Fig. 15 is a view showing a current worker information file corresponding to an example different from the example corresponding to the current worker information file shown in Figs. 4 and 12.

Fig. 16 is a view showing a current worker information file corresponding to the example and a time different from the example and the times corresponding to the current worker information files shown in Figs. 4 and 12.

Fig. 17 is a block diagram representing various functions of an assisting-work management apparatus as an embodiment of the present invention.

Please replace paragraph [0047] with the following rewritten paragraph:

[0047]   The "recommended arrival times" are respective times when the workers W1 through W5 are recommended to arrive at respective work places, and are a sort of assignment state of each worker. So long as each worker does not have any special reasons, e.g., a reason that an arrival will be delayed because of the previous assisting work, the each worker must arrive at each work place before the corresponding recommended arrival time, and start the corresponding assisting work. However, in the case where an assisting work is a work, such as a feeder replacing work, that needs to take a new material, the corresponding recommended arrival time will be a time when a worker should arrive at a work place after the worker has taken the new material. A recommended arrival time is calculated by adding an arrival-time adjusting time, shown in Fig. 2, to a material shortage time. An arrival-time adjusting time is a pre-set time that is used to adjust a recommended arrival time. For example, the reel replacing work may be started 120 seconds before a time when an operation of a general-purpose component mounting machine 10XY is stopped, and accordingly an arrival-time adjusting time corresponding to the reel replacing work is pre-set at 120 seconds. Each of the solder supplying work, the syringe replacing work, and the feeder replacing work XY is a supplying work that may not be started before an operation of a corresponding

-4-

substrate-related-operation performing machine 10 is stopped, and accordingly an arrival-time

adjusting time corresponding to each of those supplying works is pre-set at 30 seconds, so as

to start the each supplying work immediately after the machine 10 is stopped and thereby

minimize a time duration in which the machine 10 is stopped. The "priority-order times" are

respective times when the assisting works are carried out, and are a sort of priority degree of

each assisting work. An assisting work having an earlier priority-order time has a higher

priority degree for its assignment to a worker. In the supplying work list shown in Fig. 5, the

supplying works are arranged in the order of the corresponding priority-order times, i.e., from

the earliest time to the latest time, and basically those works are assigned in this order to the

workers W1 through W3W5. A priority-order time is obtained by adding a priority-order

adjusting time (Fig. 2) to a recommended arrival time. A priority-order adjusting time is a

pre-set time to adjust a priority order. For example, regarding each of the solder supplying

work, the syringe replacing work, and the feeder replacing work XY, it is desirable to carry

out the each work immediately after the operation of the corresponding substrate-related-

operation performing machine 10 is stopped by the shortage of the material consumed by the

same 10, and a priority-order adjusting time for the each work is pre-set at 30 seconds so as

to increase a priority degree of the each work. On the other hand, regarding the feeder

replacing work RO, the operation of the corresponding high-speed component mounting

machine 10RO is not stopped so soon after the material consumed by the same 10RO runs

short, and accordingly it is not needed so much to hurry the feeder replacing work RO.

Therefore, a priority-order adjusting time for the feeder replacing work RO is pre-set at 60

seconds so as to decrease a priority degree of the work. Each priority-order adjusting time

and/or each arrival-time adjusting time may be changed, as needed, based on a sort, a

frequency, and an importance of a corresponding supplying work; a skill level of each worker

(e.g., an actual time needed by the each worker to carry out a supplying work), and a total number of the workers.

Please replace paragraph [0063] with the following rewritten paragraph:

[0063]   Step S44 is followed by Step S45 to update the supplying work list such that the worker No. (e.g., W1 regarding the assignment of the work N7) of the responsible worker is recorded in the column of "responsible worker" of the objective work (e.g., N7). Then, at Step S46, the computer updates the current worker information file, such that the work ID (e.g., N7) of the objective work is recorded in the column of "assigned work" of the responsible worker (e.g., W1), and the respective work IDs (e.g., N7) recorded in the respective columns of "temporarily assigned work" of the proper candidates (e.g., W1, W2) and the respective data "Y" or "N" (e.g., "Y") recorded in the respective columns of "worker intention" of the proper candidates are deleted. In addition, the computer updates the current worker information file, such that a scheduled ~~starting~~ finishing time of the earliest one of a plurality of assigned works is recorded in the column of "scheduled ~~starting~~ finishing time of assigned work" of the responsible worker (e.g., W1); a scheduled finishing time of the latest one of the assigned works is recorded in the column of "scheduled starting time of assigned work" of the responsible worker; and an area to which the latest one of the assigned works belongs is recorded in the column of "work finishing position" of the responsible worker. For example, regarding the assignment of the work N7, only the work N7 has been assigned to the worker W1 at the current time. Therefore, the work N7 is the earliest work and the latest work. Thus, the scheduled starting time (14:04:30), the scheduled finishing time (14:07:30), and the area (area B) to which the work N7 belongs are recorded in the column of "scheduled starting time of assigned work", the column of "scheduled starting time of assigned work", and the column of "work finishing position" of the worker W1, respectively, as shown in Fig. 12. Here, a method of calculating a scheduled starting time, and a scheduled finishing time, of

a supplying work is described. Basically, a scheduled starting time of a supplying work is equal to a recommended arrival time of the supplying work. However, in the case where a supplying work needs taking a new material and is not the above-described dependent work, a scheduled starting time of the supplying work is equal to a time obtained by subtracting, from a recommended arrival time of the supplying work, a material taking time, i.e., a time needed to take the new material. Thus, the recommended arrival time, 04'30", of the work N7 is determined as the scheduled starting time of the same N7. A scheduled finishing time of a supplying work is equal to a time obtained by adding a standard needed time of the supplying work to a recommended arrival time of the same. Thus, the recommended arrival time (04'30") of the work N7, i.e., the solder supplying work, plus the standard needed time (3 minutes) of the same N7 is determined as the scheduled finishing time, 14:07:30, of the same N7. At Step S47, the computer informs the determined responsible worker of the fact that the objective work has been assigned to the worker. Though not shown, the display screen 62 of the portable terminal device 42 of the worker W1 displays the work-object code, recommended arrival time, material shortage time, and material code of the work N7, and informs, in an audible manner, the worker W1 of the fact that the supplying work has been assigned to the worker.

Please replace paragraph [0068] with the following rewritten paragraph:

[0068]   Next, there will be described how Step S33 is implemented in assigning the work N8. The work N8 is the feeder replacing work ($\bar{C}$ X$\bar{Y}$ 213), and the scheduled finishing time of the work N8 is 14:06:40 obtained by adding a standard needed time (1 minute) to the recommended arrival time (14:05:40) thereof. The computer judges that any supplying work whose recommended arrival time falls within the pre-set time duration (e.g., 2 minutes) from the time 06'40", which belongs to the area C, and whose needed skill level is "L" can be carried out. Since the work N12, i.e., the feeder replacing work RO ($\tilde{C}$ R$\bar{O}$ 205)

has the recommended arrival time, ~~07'40~~07'00", and belongs to the area C, the work N12 is

selected as the second near continuous work. Subsequently, the computer selects the third

near continuous work from one or more supplying works that belong to the same area as the

area C to which the work N8, i.e., the second near continuous work belongs, and whose

needed skill level is "L". More specifically described, the computer determines the scheduled

finishing time (7'30") of the work N8, and searches for one or more supplying works whose

recommended arrival times fall within the pre-set time following the scheduled finishing

time. Regarding the present example, however, the computer cannot find any candidates for

the third near continuous work. Therefore, the computer determines the work N8 and the

work N12 as the near continuous works, and updates the supplying work list such that data

"1" and data "N8" are recorded in the respective columns of "near continuous work" of the

work N8 and the work N12. The data "1" indicates the number of the near continuous work(s)

to be carried out following the work N8; and the data "N8" indicates the work ID of the

highest-priority work. Since the works N8, N12 as the near continuous works are assigned, as

the objective works, to one worker, a total amount of movement of that worker can be

reduced. In addition, when the worker moves to a corresponding one of the electronic-

component storage places 46, the worker can take or obtain both a new feeder needed by the

work N8 to replace the current feeder of the general-purpose component mounting machine

10XY, and a new feeder needed by the work N12 to replace the current feeder of the high-

speed component mounting machine 10RO. Therefore, the worker need not do two

reciprocations, i.e., needs to do just one reciprocation. That is, since a plurality of assisting

works out of a great number of assisting works can be carried out at once by one worker, a

sum of respective burdens applied to the workers can be reduced as a whole.

Please replace paragraph **[0070]** with the following rewritten paragraph:

[0070]   Regarding the assignment of the work N8, the computer judges, at Step S34, whether each of the workers W3 through W5 can carry out the objective works. Since the work finishing position of the worker W3 is the area A (Fig. 12), an among-area movement time needed to move from the area A to the area C where the work N8 ($\bar{C}$ X$\bar{Y}$ 213) is to be carried out is 30 seconds. Since a time, 04'00", obtained by adding the among-area movement time (30 seconds) to the scheduled finishing time (03'30") of assigned work of the worker W3 is prior to the scheduled starting time (04'40") of the work N8, the computer judges that the worker W3 can carry out the work N8. Likewise, regarding the workers W4, W5, the computer obtains a time, 02'55", by adding the among-area movement time (15 seconds) to the scheduled finishing time of assigned work of the worker W4, and obtains a time, 03'40", by adding the among-area movement time (~~15 seconds~~0 second) to the scheduled finishing time of assigned work of the worker W5. Therefore, the computer judges that the workers W4, W5 can carry out the work N8. Consequently the computer selects the workers W3 through W5 as the third candidates. Finally, the computer selects one or more proper candidates based on the position information. More specifically described, the computer selects, as a proper candidate, the worker W5 who is present in the same area C as the area C where the work N8 ($\bar{C}$ X$\bar{Y}$ 213) is to be carried out. However, in the case where there is no third candidate selected by the computer, the computer selects, as a proper candidate, one of the second candidates who has the earliest one of respective times obtained by adding the respective among-area movement times (as a sort of movement time) of the second candidates to the respective scheduled finishing times of assigned works of the same.

Please replace paragraph **[0080]** with the following rewritten paragraph:

[0080]   The responsible worker determining portion 140 includes a pre-set-worker-information-dependent determining portion 142, a current-worker-information-dependent

determining portion 144, a worker-intention-dependent determining portion 146, a related-work determining portion 148, and a simultaneous-work determining portion 150. The pre-set-worker-information-dependent determining portion 142 selects, at Steps S34, S44, and S63, the candidates to carry out the objective work, and determines the responsible worker based on the respective responsibility sections and respective worker skill levels of the candidates (the step of selecting the candidates is a portion of the step of determining the responsible worker). The current-worker-information-dependent determining portion 144 selects, at Steps S33S34, S44, and S63, the candidates to carry out the objective work, and determines the responsible worker based on the respective working states of the workers (S63), the respective assignment states and respective positions of the workers (S34, S63), or the respective work amounts of the candidates (S44, S63). The worker- intention-dependent determining portion 146 includes a candidate selecting portion 160, a pending-work informing portion 162, and a worker intention information obtaining portion 164, and determines, at Step S44, the responsible worker based on the sets of worker intention information. The candidate selecting portion 160 selects, at Step S34, the candidates to carry out the objective work, based on the pre-set worker information and the current worker information. The worker intention information obtaining portion 164 obtains, at Step S18, the sets of worker intention information and updates the corresponding columns of "worker intention" in the current worker information file. The related-work determining portion 148 determines, at Step S33, a plurality of near-position continuous works, and deals with, at Steps S34 and S44, the plurality of near-position continuous works as a plurality of objective works and determines the responsible worker to carry out the objective works. The simultaneous-work determining portion 150 determines, at Step S62, the simultaneous work to be carried out simultaneously with the objective work, and determines, at Step S63, the responsible worker to carry out the objective work. The assigned-work informing portion 180

informs, at Steps S47 and S66, the responsible worker of the objective work assigned to the worker.